

Activity

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## Reflecting on "To Fly or Not to Fly"

**Educator:** John Moosbrugger, Professor, Department of Mechanical Engineering & Aeronautical Engineering; Associate Dean of Academic Programs

**Context:** In-class; Engineering & Society

**Keywords:** first-year experience, ethics, role-playing

**Student Activity Time:** 10-15 minutes in-class

*Students reflected on their experience debating an ethical issue.*

### Introducing the Reflection Activity

In one of the three week-long class modules, in a required engineering and society course, first-year engineering students and a few non-engineering majors (90% engineering freshmen and 10% upper classmen from business) engaged in learning about and discussing engineering ethics. As a capstone to the ethics module, students participated in a role-playing activity simulating an ethically challenging situation entitled "To Fly or Not to Fly." The purpose of this activity was for students to play different roles in a discussion regarding whether or not a potentially damaged plane should take its pre-scheduled test flight.

At the culmination of the role-playing activity, students were asked to reflect on the experience in two ways: (1) an informal in-class discussion and (2) a formal out-of-class written reflection assignment. The purpose of the reflection activities was to support students in thinking about how non-technical factors influence technical decisions.

In the in-class discussion, students with specific roles were asked to describe their experiences and were invited to talk about their roles, specifically in reference to what it meant to debate based on a strong personality and particular interest in the flight of the plane. Observers were asked to reflect on different dimensions that they saw impacting the decision making process. In the formal written reflection assignment, students reflected on the role-playing activity by responding to two questions:

1. If you acted a role, reflect on the impact that your character had on the decision making process and on the ultimate decision made – to fly or not to fly OR if you were an observer, reflect on the impact of this type of statement/action on the decision making process and on the ultimate decision made – to fly or not to fly.
2. Consider what you have learned about non-technical factors influencing technical decisions. Briefly describe whether the decision that was made today was based primarily on technical or non-technical factors. Or, describe how non-technical factors affected an otherwise technical decision.

In terms of outcomes, this activity provided students with an opportunity to engage in debating an engineering ethical issue. By debating an ethical issue, students may now be more aware of the types of ethical issues they may encounter in their professional career. They also may be more prepared for when they encounter ethical issues in their future. In the reflection component of the activity, students were asked to briefly describe whether the decision that was made during class was based primarily on technical or non-technical factors, or to describe how non-technical factors affected an otherwise technical decision.

#### Recreating the Reflection Activity

	Description
1	Assign students to review the activity and assign roles to students.
2	Implement the role-playing activity with students.
4	Assign the written reflection.
5	Grade reflections using a credit/no credit rubric.

DIGITAL LIBRARY CONTENT	
1.1	Situation Sketch
1.2	Role Playing Reflection
1.3	Teacher Instruction
1.4	Student Role Description

#### In the words of the Educator: Tips and Tricks

*Debrief the reflection assignment.* When handing the written assignment back to students, take a few minutes to debrief what you saw in the reflections.

*Get students to read and study their roles.* In my experience, it seems like students don't quite read and study the roles carefully enough to get into the particular character. In this activity, it's important for them to understand how various personalities affect the decision making process. The course description of the characters was designed to include some pretty strong character traits that have the potential to heavily influence the course of the discussion. One of the biggest things they should get out of reflecting on this experience is how personalities can influence decision-making. In the end, one of the biggest lessons learned is that it is important to spend some time figuring out ways to really think about this challenge ahead of time.

*Allow enough time for the activity.* Another potential challenge with this activity is allowing enough time during class for the entire activity from start to reflection. In my experience, it is always a bit rushed, so there is little time at the end to collectively reflect on the activity. If time continues to be an issue, I would suggest exploring ways to scale it down to fit the amount of time that you have. Even though the discussion itself isn't supposed to take that long, getting the class organized and collectively reflecting at the end all take time. In the end, there certainly is flexibility to use the basic idea and basic scenario to guide doing such an activity, but in different ways for different contexts.

*Bring the reflection component into focus.* While there is a reflection component to this activity, it is not focused enough and I have not thought carefully enough on the reflection part. I would suggest thinking more about the reflection component. For example, what are different lenses that students can view the activity through? What other types of lenses can we offer students to support reflections on this activity?

*What was the inspiration for the reflection activity?* As I moved into administration, there was a strategic initiative to introduce a first-year course on engineering and society. I had the opportunity to contribute to the development and implementation of such a course.

When I teach this course, I teach alongside a team. Other team members are teaching their own sections of the same course. Throughout the semester, we meet to discuss the class. This particular class activity (role playing in “To Fly or Not to Fly”) was proposed by one of my colleagues, Karen Buckle, a few years ago. This role-play activity was adapted from a role-play scenario developed at Delft University of Technology.<sup>1</sup> As a team, we’ve successfully been using the activity for a few years.

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<sup>1</sup> This role-play activity was adapted from a role-play scenario developed at Delft University of Technology and references the following work: Kroesen, JO (TPM Sect. Philosophy) & Zwaag, S van der (LR Ch. Fundamentals of Advanced Materials) (2010). Teaching ethics to engineering students: from clean concepts to dirty tricks. The impact of practical circumstances and personal relationships on ethical decision-making. In DE Goldberg & IR van de Poel (Eds.), *Philosophy and engineering: an emerging agenda (Philosophy of engineering and technology, 2)* (pp. 127-137). Dordrecht / New York / Berlin: Springer (ISBN 978-90-481-2803-7).